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June 28, 2019

Mr. Ravi Sanga
EPA Remedial Project Manager
U.S. EPA Region 10
1200 Sixth Avenue, ECL 111
Seattle, WA 98101

RE: Revised Groundwater Sampling Schedule and Sitewide Exceedance Analysis Report

Dear Mr. Sanga:

Please find enclosed three (3) copies of the *Revised Groundwater Sampling Schedule and Sitewide Exceedance Analysis* Report. An electronic version of the report is also included.

If you have any questions, please feel free to contact me at 541.812.7376.

Sincerely,

Noel Mak

NPL Program Coordinator

Enclosures: 1. *Revised Groundwater Sampling Schedule and Sitewide Exceedance Analysis Report*

Technical Memorandum

To: **Noel Mak/ATI Millersburg Operations**

From: **Renee Fowler/GSI Water Solutions, Inc.**
Kathy Roush/GSI Water Solutions, Inc.

Date: **June 28, 2019**

Re: **Revised Groundwater Sampling Schedule and Sitewide Exceedance Analysis Report**

This technical memorandum (TM) documents proposed changes to the biannual and annual performance monitoring schedule for the Fabrication, Extraction, Solids, and Farm Ponds Areas at the ATI Millersburg Operations (Oregon) (ATI) facility, formerly ATI Wah Chang. These changes are in response to the 2016 sitewide sampling event results and a review of historical groundwater data.

1. Background

Groundwater elevation and analytical data have been collected at the ATI facility from the 1980s. The horizontal and vertical extent of impact is well understood and groundwater flow information is well documented. Therefore, modifying the groundwater monitoring program at this time is appropriate.

Performance monitoring events historically have been conducted in the spring and fall seasons at the Fabrication and Extraction Areas and include collecting water level information and collecting groundwater samples for laboratory analysis from most of the monitoring and extraction wells. Performance monitoring events have occurred annually at the Solids and Farm Ponds Areas, and have historically included measuring water level information and collecting groundwater sample for laboratory analysis from all of the Solids Area monitoring wells and select monitoring wells at the Farm Ponds Area. Groundwater elevations are collected from the vast majority of wells during these events. The current groundwater monitoring schedule is outlined in Table B-1 of the *Quality Assurance and Control Plan for Site-Wide Remedial Actions* (QAPP; GSI, 2015), issued in March 2016. The biannual monitoring schedule for surface water is provided in Table B-2 of that document. There are no changes to the surface water monitoring program proposed at this time and surface water will not be discussed further as part of this TM. In addition, no changes to the procedures or protocols outlined in the QAPP are planned.

In 2016, a sitewide sampling event was conducted with additional constituents analyzed that are not routine for the biannual performance monitoring event (GSI, 2018). Some wells had cleanup standard exceedances for constituents that are not included in the biannual performance monitoring. These constituents were resampled in subsequent years (2017, 2018, or 2019) for verification and evaluation purposes. However, dissolved metals were not resampled because total metals will be used for evaluation. Table 1 presents the 2016 sitewide results and the subsequent resampling results. Although some resample results were below the cleanup standard, several results remained above the cleanup standard from the 2016 sitewide sampling event. ATI used these data to determine what modifications are needed to the monitoring program, and these modifications are outlined below.

Groundwater monitoring results for each of the areas are outlined in TMs that are issued on an annual basis. In addition, as described above, a sitewide sampling event was conducted in 2016 and select samples were reanalyzed for various constituents of concern (COCs) in 2018. The results of these efforts were documented in the following submittals.

- *Sitewide Groundwater and Surface Water Sampling Results – 2016, Revised* (GSI Water Solutions, March 2018)
- *Solids Area Groundwater Remedial Action Progress Summary – Year 2018* (GSI Water Solutions, March 2019)
- *Extraction Area Groundwater Remedial Action Progress Summary – Year 2018* (GSI Water Solutions, March 2019)
- *Fabrication Area Groundwater Remedial Action Progress Summary – Year 2018* (GSI Water Solutions, April 2019)
- *Farm Ponds Area Groundwater Remedial Action Progress Summary – Year 2018* (GSI Water Solutions, March 2019)

These documents provide detailed groundwater quality data that are not repeated in this TM. The groundwater flow and analytical data provided in these reports were used to develop the proposed modifications to the monitoring program at each of the areas.

2. General Approach

GSI Water Solutions, Inc. (GSI) has developed a rotating monitoring schedule, which is outlined in Table 2. In lieu of sampling and gauging the majority of the monitoring and extraction points as part of both biannual events, the spring event will be more limited, including primarily site perimeter wells. Samples will be collected along the perimeter of the property and/or the area to confirm that the COCs are not migrating beyond the facility boundaries, as described in the Record of Decision (ROD) for Operable Unit (OU) 2 consisting of sediments and groundwater (EPA, 1994). Also included are a few select wells in more highly impacted zones where additional data are warranted. Given that water table conditions are well documented, the spring event does not include gauging the full suite of groundwater monitoring wells, but only those wells being sampled in accordance with low-flow sampling methodology. Synoptic groundwater elevation measurements will not be collected as part of the spring event.

The previous sampling schedule included collecting groundwater samples from the extraction wells on a biannual basis. The modified schedule includes sampling extraction wells annually

as part of the fall event. This frequency will apply to extraction wells no longer in operation. Extraction wells currently operating are sampled on a quarterly basis to evaluate system effectiveness and the volume of mass removed.

The spring event was selected for the limited event because concentrations of the COCs are generally slightly less, given that water table levels are higher. The fall event will serve as the comprehensive monitoring event.

As outlined in Table 2, there is minimal change to the overall monitoring plan for the fall event versus what was previously performed. However, based on results of the 2016 sitewide sampling event, several COCs were added to the analyte list of wells that will be sampled during the fall event. COCs added to the analyte lists of select wells include total arsenic, total beryllium, nitrate, fluoride, radium-226 and radium-228, and pentachlorophenol (PCP).

3. Extraction Area – Main Plant Area

Feed Makeup Area

Monitoring and extraction wells in the Feed Makeup Area (FMA) historically have been sampled on a biannual basis. Based on the limited extent of the groundwater impact, GSI personnel believe the groundwater monitoring program can be modified to include a limited event conducted in the spring. This limited event will consist of sampling perimeter wells PW-21A and PW-23A, and monitoring well PW-28A, which is located in a more impacted portion of the plume (Figure 1). Groundwater elevations would be collected from these three wells, instead of across the entire FMA.

For the fall event (Figure 2), analytes have been added to the monitoring program based on results of the sitewide exceedance sampling.

- **Beryllium.** Added to the analyte lists for wells EW-1, EW-2, PW-28A, PW-50A, and PW-52A. Samples collected from well PW-23A will also be analyzed for the presence of total beryllium to monitor the downgradient limits of the impact.
- **Nitrate**. Added to the analyte lists for wells PW-21A, PW-24A, PW-27A, and PW-51A. Samples collected from well PW-23A will also be analyzed for the presence of nitrate to monitor the downgradient limits of the impact.
- **PCP**. Added to the analyte list for wells EW-3 and PW-50A. Samples collected from wells PW-22A and PW-23A will also be analyzed for the presence of PCP to monitor the downgradient limit of PCP impact.

South Extraction Area

Groundwater concentrations of COCs in the South Extraction Area (SEA) have declined significantly over the last decade. Groundwater concentrations have been below their cleanup standards for the last 5 years in all but one monitoring well (PW-96A). Additionally, EPA stated in the Fifth Five Year Review that "cleanup goals have been met in the SEA" (EPA, 2017). Until closure of the SEA is complete, ATI proposes to limit the groundwater monitoring conducted in the SEA to sampling only well PW-96A during the fall event. Samples collected from this well will be analyzed for the presence of chlorinated volatile organic compounds (CVOCs) and total

arsenic. No additional wells in the SEA will be gauged or sampled as part of the annual sampling event.

4. Fabrication Area – Main Plant Area

Monitoring and extraction wells historically have been sampled on a biannual basis. As shown in Table 2 and Figure 3, the spring event in the Fabrication Area will consist of sampling and gauging of (1) wells along the perimeter of the facility and (2) select monitoring wells to evaluate the more impacted portions of the plume (e.g., PW-30A). The comprehensive monitoring event will be conducted in the fall (Figure 4).

Based on results of the sitewide sampling event conducted in 2016 and resampling done in subsequent years, additional analytes have been added to a few select wells for the fall sampling event as outlined below.

Acid Sump Area

- **Arsenic**. Wells TMW-3 and TWM-5
- **Beryllium**. Wells TMW-3 and TWM-5
- **CVOCs**. Well PW-81A
- **PCP**. Well FW-3 and PW-82A

Ammonium Sulfate Storage Area

- **Nitrate**. Wells FW-5 and PW-03A
- **Fluoride**. Well FW-5
- **CVOCs**. Well FW-5
- **PCP**. Wells PW-03A and PW-83A. Samples from wells PW-01A and PW-89A will also be analyzed for PCP to monitor the horizontal limit of impact.

Former Crucible Cleaning Area (FCCA)

- **Arsenic**. Wells MW-02A, MW-03A, PW-69A, PW-93A, and PW-94A. Samples from wells FW-07 and PW-72A will also be analyzed for arsenic to monitor the horizontal limit of impact.
- **Nitrate**. Well PW-31A. Samples from wells MW-03A and PW-68A will also be analyzed for nitrate to monitor the horizontal limit of impact.
- **Fluoride**. Wells PW-69A, PW-94A, and PW-95A
- **PCP**. Well PW-31A. Samples from wells MW-03A and PW-68A will also be analyzed for PCP to monitor the horizontal limit of impact.

No additional analytes were added to wells located in the Material Recycle Area or the Dump Master Area. Total arsenic was detected in well PW-74A in the Dump Master Area and wells MW-07A and MW-08A in the FCCA at concentrations exceeding its cleanup standard during

the sitewide sampling events. However, these wells have not historically been included as part of the biannual sampling event, and were not added to the sampling program.

Historical data from the Fabrication Area were evaluated to determine the analytes that could be removed from the monitoring program. These analytes have not been detected at concentrations at or above their ROD cleanup standards (as applicable) in more than 5 years. The analytes removed from the sampling schedule include nitrate in wells PW-10 and PW-80A, fluoride in well PW-80A, ammonia in wells PW-84AR and PW-92A, and iron from well FW-5.

While the spring event includes primarily perimeter wells (Figure 3), the wells included in the fall event were not modified from the previous plan with the exception of adding well PW-81A.

5. Solids Area

Groundwater monitoring is conducted on an annual basis in the Solids Area. The results of annual monitoring in the Solids Area through 2018 have been non-detect or detected below the cleanup standards since 2008, with the exception of fluoride, which was not detected above the cleanup standard in 2018. ATI will continue to monitor the Solids Area in accordance with Section 10.1.1.3 of the ROD.

The site includes five hydrostratigraphic units (i.e., Recent Alluvium, Willamette Silt, Linn Gravel, Blue Clay, and Spencer Formation). Seventeen monitoring wells have been installed in the Solids Area and are completed in three of the hydrostratigraphic units. While developing the revised sampling program for the Solids Area, the completion interval was taken into account to confirm that data would be obtained to evaluate each water-bearing zone.

As presented in Table 2 and Figure 5, wells PW-07, PWC-1, and PWC-2 no longer will be included in the annual monitoring program. These wells have not had an exceedance of COCs in more than 5 years and are located on the hydraulically upgradient portion of the property, and upgradient of groundwater impacts. Samples from wells PWC-1 and PWC-2 historically have been analyzed only for chloride.

In response to the sitewide sampling results, the following compounds were added to the analyte list for the selected wells below. The analytes were added because these compounds were present at concentrations exceeding their respective cleanup standard in both the 2016 and subsequent events.

- **Arsenic**. Wells PWB-1, PWB-2, and PWE-1. Samples from wells PW-18B and PWD-1 will also be analyzed for the presence of arsenic to evaluate the horizontal limits of impact.
- **Cyanide**. Well PWF-1. Well PWF-2 will be analyzed for the presence of cyanide to monitor the vertical limit of impact.
- **Radium-226 and radium-228**. Well PWB-3.

Historical data from the Solids Area were evaluated to determine the analytes that could be removed from the monitoring program. These analytes have not been detected at concentrations at or above their ROD cleanup standards in more than 5 years. These changes are:

- **Fluoride**. Wells PW-07, PW-09, PW-17B, PW-18B, PWB-1, and PWB-2.
- **Nitrate**. Wells PW-07, PWF-1 and PWF-2.
- **Chloride.** Wells PW-07, PWC-1 and PWC-2.
- **Radium-226 and radium-228**. Well PW-07.

6. Farm Ponds Area

The U.S. Environmental Protection Agency (EPA) authorized annual groundwater monitoring at the Farm Ponds Area in 2003. As of 2016, annual groundwater sampling has been conducted in the late spring when the area was dry enough to access. Because of access issues, the Farm Ponds Area will be sampled during the spring event.

COCs in the Farm Pond Area have consisted of CVOCs. CVOCs above ROD cleanup standards have been detected only in well PW-104S and there is no indication that the CVOCs are migrating. The impact is present within the Willamette Silt and groundwater velocities in this unit are extremely slow. ATI is developing a completion plan consistent with EPA guidance to certify that the remedial action in the Farm Ponds Area has met the remedial action objectives and cleanup standards stipulated in the ROD in support of a partial delisting of the Farm Ponds Area. A petition letter was sent on December 10, 2018, to notify EPA of ATI's intention of partial delisting of the Farm Ponds Area and ATI is awaiting a meeting with EPA to discuss the path forward.

Until final delisting is complete, ATI proposes to limit the groundwater monitoring conducted in the Farm Ponds Area. As shown in Table 2 and Figure 6, subsequent events (if required) would consist only of sampling three wells: PW-104S and two downgradient wells (PW-105S and PW107S). No additional wells would be gauged or sampled as part of the annual sampling event.

7. Summary

ATI has evaluated the historical data and results of the sitewide exceedance data to develop a revised monitoring program for the facility. With groundwater elevation and quality data available for the last several decades, the groundwater monitoring program can be reduced to a rotating schedule for the Fabrication and Extraction Areas. The schedule for these areas include sampling selected perimeter and hot spot wells as part of the spring event. A comprehensive groundwater gauging event will not be conducted in the spring. The fall event will remain relatively unchanged from historical monitoring events and will include sampling most of the monitoring and extraction wells, and collecting groundwater gauging data across the facility. Based on the 2016 sitewide sampling event, select analytes have been added to the fall event.

8. References

EPA. 1994. Record of Decision for the Groundwater and Sediments Operable Unit for ATI Wah Chang Albany. U.S. Environmental Protection Agency. June 1994.

EPA. 2017. Fifth Five-Year Review Report for Teledyne Wah Chang Superfund Site, Linn County, Oregon. U. S. Environmental Protection Agency. December 2017.

GSI. 2016. Quality Assurance Project Plan for Site-Wide Remedial Actions. Prepared by GSI Water Solutions, Inc. March 2016.

GSI. 2018. Sitewide Groundwater and Surface Water Sampling Results – 2016, Revised. Prepared by GSI Water Solutions, Inc. March 2018.

Table 1. Sitewide Exceedance Resampling Results

ATI Millersburg Operations, Oregon

Area	Well	Analyte	Cleanup Standard	Units	2016 Sitewide Result	Resample Date	2018 Resample Result
Fabrication	FW-3	Pentachlorophenol	1	µg/L	**2.51 J**	10/4/2018	**1.80**
	FW-5	Cadmium, Dissolved	5	µg/L	**5.06**	--	--
		Cadmium, Total	5	mg/L	**6.58**	10/2/2018	0.383
		Fluoride	4	mg/L	**16.6**		**23.2**
		Nitrate	10	µg/L	**62.2**		**14.7**
		Trichloroethene	5	µg/L	**5.78**		**41.8**
	MW-02A	Arsenic, Dissolved	10	µg/L	**20.1**	--	--
		Arsenic, Total	10	µg/L	**19.9**	10/16/2018	**21.5**
	MW-03A	Arsenic, Dissolved	10	µg/L	**11.1**	--	--
		Arsenic, Total	10	µg/L	**11.4**	10/16/2018	**10.3**
	MW-07A	Arsenic, Dissolved	10	µg/L	**18.6**	--	--
		Arsenic, Total	10	µg/L	**19.2**	10/16/2018	**39.4**
	MW-08A	Arsenic, Dissolved	10	µg/L	**32**	--	--
		Arsenic, Total	10	µg/L	**24.5**	10/16/2018	**31.7**
	PW-03A	Nitrate	10	mg/L	**19.9**	10/3/2018	**17.5**
		Pentachlorophenol	1	µg/L	**5.55**		**1.80**
	PW-15AR	Radium 226/228	5	pCi/L	**16.6**	5/16/2017	2.7
	PW-31A	Nitrate	10	mg/L	**13.2**	10/4/2018	**10.7**
		Pentachlorophenol	1	µg/L	**2.61**		**2.27**
	PW-69A	Arsenic, Dissolved	10	µg/L	**19.9**	--	--
		Arsenic, Total	10	µg/L	**19.8**	10/4/2018	**20.1**
		Fluoride	4	mg/L	**8.89**		**10.2**
	PW-71A	Arsenic, Dissolved	10	µg/L	**16.7**	--	--
		Arsenic, Total	10	µg/L	**16.7**	5/2/2019	6.23
	PW-74A	Arsenic, Total	10	µg/L	**80.1**	10/10/2018	**18.0**
	PW-81A	1,1-dichloroethene	7	µg/L	**7.53**	10/10/2018	**25.2**
	PW-82A	Pentachlorophenol	1	µg/L	**2.59**	10/11/2018	**1.00**
	PW-83A	Pentachlorophenol	1	µg/L	**2.51**	10/3/2018	**2.09**
	PW-89A	Radium-226, -228	5	pCi/L	**11.29**	10/12/2018	0.59
	PW-93A	Arsenic, Dissolved	10	µg/L	**23.3**	--	--
		Arsenic, Total	10	µg/L	**23.2**	10/11/2018	**23.5**
	PW-94A	Arsenic, Dissolved	10	µg/L	**12.6**	--	--
		Arsenic, Total	10	µg/L	**12.7**	10/17/2018	**11.9**
		Fluoride	4	mg/L	**7.04**		**6.26**
						6/7/2018	**7.10**

Table 1. Sitewide Exceedance Resampling Results

ATI Millersburg Operations, Oregon

Area	Well	Analyte	Cleanup Standard	Units	2016 Sitewide Result	Resample Date	2018 Resample Result
Fabrication	PW-95A	Fluoride	4	mg/L	**9.84**	10/4/2018	**4.52**
	TMW-3	Arsenic, Total	10	µg/L	**11.5**	10/4/2018	**18.9**
		Beryllium, Dissolved	1	µg/L	**5.37**	--	--
		Beryllium, Total	1	µg/L	**6.13**	10/4/2018	**5.61**
	TMW-5	Arsenic, Dissolved	10	µg/L	**86**	--	--
		Arsenic, Total	10	µg/L	**71.6**	10/4/2018	**34.5**
		Beryllium, Dissolved	1	µg/L	**1.44**	--	--
		Beryllium, Total	1	µg/L	**1.63**	10/4/2018	**2.18**
Extraction	EW-1	Beryllium, Dissolved	1	µg/L	**13.8**	--	--
		Beryllium, Total	1	µg/L	**16.1**	10/30/2018	**12.9**
		Pentachlorophenol	1	µg/L	**3.63**	10/30/2018	0.215 U
	EW-2	Beryllium, Dissolved	1	µg/L	**9.56**	--	--
		Beryllium, Total	1	µg/L	**10.7**	10/30/2018	**9.75**
		Cadmium, Dissolved	5	µg/L	**11.8**	--	--
		Chromium, Dissolved	100	µg/L	**659**	--	--
		Pentachlorophenol	1	µg/L	**3.51**	10/30/2018	0.138
		Uranium, Dissolved	0.03	mg/L	**0.0394**	--	--
		Uranium, Total	0.03	mg/L	**0.0435**	10/30/2018	0.0191
	EW-3	Pentachlorophenol	1	µg/L	**4.08**	10/30/2018	**1.7**
	PW-21A	Nitrate	10	mg/L	**15.8**	10/18/2018	**107**
	PW-24A	Nitrate	10	mg/L	**16.6**	10/11/2018	**14.2**
	PW-27A	Nitrate	10	mg/L	**42.2**	10/11/2018	**27.9**
	PW-28A	Beryllium, Dissolved	1	µg/L	**3.46**	--	--
		Beryllium, Total	1	µg/L	**3.75**	5/13/2019	**9.13**
		Uranium, Total	0.03	mg/L	**0.0313**	10/31/2018	0.001 U
	PW-50A	Beryllium, Total	1	µg/L	**3.08**	10/30/2018	**7.51**
		Pentachlorophenol	1	µg/L	**30.4**	10/30/2018	**17.5**
	PW-51A	Nitrate	10	mg/L	**107**	10/18/2018	**74.0**
	PW-52A	Beryllium, Dissolved	1	µg/L	**18.8**	--	--
		Beryllium, Total	1	µg/L	**20**	10/18/2018	**23.6**
		Nitrate	10	mg/L	**21**	10/18/2018	0.250 U
	PW-96A	Arsenic, Dissolved	10	µg/L	**17.6**	--	--
		Arsenic, Total	10	µg/L	**17.4**	5/1/2019	**13.8**
Solids	PWB-1	Arsenic, Dissolved	10	µg/L	**10.1**	8/22/2018	**11.8**
		Arsenic, Total	10	µg/L	**10.1**	8/22/2018	**11.3**

Table 1. Sitewide Exceedance Resampling Results

ATI Millersburg Operations, Oregon

Area	Well	Analyte	Cleanup Standard	Units	2016 Sitewide Result	Resample Date	2018 Resample Result
Solids	PWB-2	Arsenic, Dissolved	10	µg/L	**14.5**	8/22/2018	**14.6**
		Arsenic, Total	10	µg/L	**14.2**	8/22/2018	**16.1**
	PWB-3	Radium-226	5	pCi/L	**1.5**	8/22/2018	**11**
		Radium-228		pCi/L	**5.5**	8/22/2018	**3.3**
	PWE-1	Arsenic, Dissolved	10	µg/L	**11.1**	8/22/2018	**10.5**
		Arsenic, Total	10	µg/L	**10.3**	8/22/2018	**10.9**
	PWF-1	Cyanide	200	µg/L	**275**	8/24/2018	**224**
	PWF-2	Cyanide	200	µg/L	**323**	8/24/2018	95.7

Notes:

-- = not analyzed; dissolved constituents were not resampled

µg/L = microgram per liter

mg/L = milligram per liter

pCi/L = picocuries per liter

U = analyte not detected above method reporting limit

Bold indicates detected concentration meets or exceeds the cleanup standard.

Table 2. Revised Summary of Analysis for Groundwater, Quality Assurance Project Plan **June 2019**

ATI Millersburg Operations, Oregon

Station	Well Type	Water Level		Sampling		Field Parameters		Laboratory Analysis										
								Metals		Anions/Cations				TDS	Radium 226/228	CVOCs	EISB MNA	PCP
		Spring	Fall	Spring	Fall	Spring	Fall	As, Cd, Ni	Other	Cl	NH_3	NO_3	F					
Extraction Area																		
Feed Makeup Area																		
EW-1	REC				x		x	x	Be	x	x		x	x	x			
EW-2	REC				x		x	x	Be	x	x		x	x	x			
EW-3	REC				x		x	x		x	x		x	x	x			x
PW-21A	P	x	x	x	x	x	x	x		x	x	x	x	x	x			
PW-22A	P		x		x		x	x		x	x		x	x	x			x
PW-23A	P	x	x	x	x	x	x	x	Be	x	x	x	x	x	x			x
PW-24A	P		x		x		x	x		x	x	x	x	x	x			
PW-27A	NHS		x		x		x	x		x	x	x	x	x	x			
PW-28A	HS	x	x	x	x	x	x	x	Be	x	x		x	x	x			
PW-50A	NHS		x		x		x	x	Be	x	x		x	x	x			x
PW-51A	NHS		x		x		x	x		x	x	x	x	x	x			
PW-52A	NHS		x		x		x	x	Be	x	x		x	x	x			
South Extraction Area																		
EW-4	REC																	
EW-5	REC																	
EW-6	REC																	
PW-25A	P																	
PW-26A	P																	
PW-29A	P																	
PW-47A	NHS																	
PW-48A	NHS																	
PW-49A	P																	
PW-57A	P																	
PW-96A	NHS		x		x		x	As								x		
PW-97A	P																	

Table 2. Revised Summary of Analysis for Groundwater, Quality Assurance Project Plan **June 2019**

ATI Millersburg Operations, Oregon

Station	Well Type	Water Level		Sampling		Field Parameters		Laboratory Analysis										
								Metals		Anions/Cations				TDS	Radium 226/228	CVOCs	EISB MNA	PCP
		Spring	Fall	Spring	Fall	Spring	Fall	As, Cd, Ni	Other	Cl	NH_3	NO_3	F					
Fabrication Area																		
Acid Sump Area																		
FW-3	REC				x		x					x	x			x		x
E-11	HS		x		x		x					x	x			x	EISB	
EI-5	HS		x		x		x					x	x			x	EISB	
FW-6	NHS		x		x		x					x	x			x	MNA	
I-2	HS		x		x		x					x	x			x	EISB	
I-3	HS		x		x		x					x	x			x	EISB	
PW-10	NHS		x		x		x						x			x		
PW-11	HS		x		x		x					x	x			x	MNA	
PW-12	NHS		x		x		x					x	x			x	MNA	
PW-13	HS		x		x		x					x	x			x	EISB	
PW-14	NHS		x															
PW-15AR	P		x															
PW-16A	NHS	x	x	x	x	x	x					x	x			x	MNA	
PW-19A	NHS	x	x	x	x	x	x					x	x			x		
PW-32A	NHS		x															
PW-33A	NHS		x															
PW-34A	NHS		x															
PW-76A	P	x	x	x	x	x	x					x	x			x	MNA	
PW-77A	P	x	x	x	x	x	x					x	x			x	EISB	
PW-78A	P	x	x	x	x	x	x					x	x			x	EISB	
PW-79A	P	x	x	x	x	x	x					x	x			x	MNA	
PW-80A	NHS		x		x		x									x		
PW-81A	NHS		x		x		x									x		
PW-82A	NHS		x		x		x					x	x			x		x
PW-98A	NHS		x		x		x					x	x			x	MNA	

Table 2. Revised Summary of Analysis for Groundwater, Quality Assurance Project Plan **June 2019**

ATI Millersburg Operations, Oregon

Station	Well Type	Water Level		Sampling		Field Parameters		Laboratory Analysis										
								Metals		Anions/Cations				TDS	Radium 226/228	CVOCs	EISB MNA	PCP
		Spring	Fall	Spring	Fall	Spring	Fall	As, Cd, Ni	Other	Cl	NH_3	NO_3	F					
PW-99A	NHS		x		x		x					x	x			x	MNA	
TMW-3	HS		x		x		x	As	Be			x	x			x		
TMW-5	HS		x		x		x	As	Be			x	x			x	EISB	
Ammonium Sulfate Storage Area																		
FW-5	REC				x		x				x	x	x			x		
PW-01A	NHS		x		x		x				x					x		x
PW-03A	NHS		x		x		x				x	x				x		x
PW-83A	NHS		x		x		x				x					x		x
PW-89A	NHS	x	x	x	x	x	x				x	x	x			x		x
PW-92A	NHS		x		x		x									x		
Former Crucible Cleaning Area																		
FW-1	REC				x		x									x		
FW-7	REC		x		x		x	As								x		
MW-01A	NHS	x	x	x	x	x	x									x		
MW-02A	NHS		x		x		x	As								x		
MW-03A	NHS		x		x		x	As				x				x		x
MW-04A	NHS		x		x		x									x		
MW-05A to MW-11A	P		x															
PW-31A	NHS		x		x		x					x				x		x
PW-45A	NHS		x		x		x									x		
PW-68A	NHS	x	x	x	x	x	x					x				x		x
PW-69A	NHS		x		x		x	As					x			x	EISB	
PW-70AR	NHS		x		x		x									x		
PW-71A	NHS		x		x		x									x		
PW-72A	NHS		x		x		x	As								x		
PW-93A	HS		x		x		x	As								x	EISB	

Table 2. Revised Summary of Analysis for Groundwater, Quality Assurance Project Plan **June 2019**

ATI Millersburg Operations, Oregon

Station	Well Type	Water Level		Sampling		Field Parameters		Laboratory Analysis										
								Metals		Anions/Cations				TDS	Radium 226/228	CVOCs	EISB MNA	PCP
		Spring	Fall	Spring	Fall	Spring	Fall	As, Cd, Ni	Other	Cl	NH_3	NO_3	F					
PW-94A	HS		x		x		x	As					x			x	EISB	
PW-95A	HS		x		x		x						x			x	EISB	
PW-100A	HS		x		x		x									x	EISB	
PW-101A	NHS		x		x		x									x	EISB	
Material Recycle Area																		
FW-2	REC				x		x									x		
PW-20A	NHS		x															
PW-42A	NHS		x		x		x									x		
PW-84AR	NHS		x		x		x									x		
PW-85A	NHS		x		x		x									x		
PW-86A	NHS		x		x		x									x		
PW-87A	NHS		x		x		x									x		
PW-88A	NHS		x		x		x									x		
PZ-01A	NHS		x															
Dump Master Area																		
FW-4	REC				x		x									x		
PW-30A	HS	x	x	x	x	x	x									x		
PW-46A	NHS		x		x		x									x		
PW-73B	NHS		x		x		x									x		
PW-73A	NHS		x															
PW-74A	NHS		x															
PW-74B	NHS		x		x		x									x		
PW-75A	NHS	x	x	x	x	x	x									x		
PW-91A	NHS		x		x		x									x		

Table 2. Revised Summary of Analysis for Groundwater, Quality Assurance Project Plan **June 2019**

ATI Millersburg Operations, Oregon

Station	Well Type	Water Level		Sampling		Field Parameters		Laboratory Analysis									
								Metals		Anions/Cations				TDS	Radium 226/228	CVOCs	EISB MNA	PCP
		Spring	Fall	Spring	Fall	Spring	Fall	As, Cd, Ni	Other	Cl	NH_3	NO_3	F					
Solids Area																		
PW-07	NA		x															
PW-09	NA		x		x		x			x								
PW-17B	NA		x		x		x			x								
PW-18B	NA		x		x		x	As		x								
PWA-1	NA		x		x		x			x								
PWA-2	NA		x		x		x			x								
PWB-1	NA		x		x		x	As		x								
PWB-2	NA		x		x		x	As		x								
PWB-3	NA		x		x		x			x			x		x			
PWC-1	NA		x															
PWC-2	NA		x															
PWD-1	NA		x		x		x	As		x								
PWD-2	NA		x		x		x			x								
PWE-1	NA		x		x		x	As		x			x					
PWE-2	NA		x		x		x			x			x					
PWF-1	NA		x		x		x		Cn	x								
PWF-2	NA		x		x		x		Cn	x								

Table 2. Revised Summary of Analysis for Groundwater, Quality Assurance Project Plan **June 2019**

ATI Millersburg Operations, Oregon

Station	Well Type	Water Level		Sampling		Field Parameters		Laboratory Analysis										
								Metals		Anions/Cations				TDS	Radium 226/228	CVOCs	EISB MNA	PCP
		Spring	Fall	Spring	Fall	Spring	Fall	As, Cd, Ni	Other	Cl	NH_3	NO_3	F					
Farm Ponds Area																		
PW-40A	NA																	
PW-40S	NA																	
PW-43A	NA																	
PW-44A	NA																	
PW-64A	NA																	
PW-64S	NA																	
PW-65A	NA																	
PW-65S	NA																	
PW-66A	NA																	
PW-66S	NA																	
PW-67S	NA																	
PW-68A	NA																	
PW-104S	NA	x		x		x										x		
PW-105S	NA	x		x		x										x		
PW-106S	NA																	
PW-107S	NA	x		x		x										x		
PW-108S	NA																	
SD	NA																	
WD1	NA																	
WD2	NA																	

Table 2. Revised Summary of Analysis for Groundwater, Quality Assurance Project Plan **June 2019**

ATI Millersburg Operations, Oregon

Notes:

As = total arsenic

Be = total beryllium

Cd = total cadmium

Cl = chloride

Cn = cyanide

CVOCs = chlorinated volatile organic compounds

EISB = enhanced in-situ bioremediation (CVOC, NO_3, Cl, SO_4, Alkalinity, MEE)

F = fluoride

HS = hot spot

MNA = monitored natural attenuation (CVOC, NO_3, Cl, SO_4, Alkalinity)

MEE = methane, ethane, ethene

NA = not applicable

NHS = non-hot spot

Ni = total nickel

NO_3 = nitrate

NH_3 = ammonia

P = perimeter

PCP = pentachlorophenol

SO_4 = sulfate

TDS = total dissolved solids

Table B-1 displays a summary of analyses for routine groundwater monitoring. ATI will prepare an addendum to the table and submit it to EPA for special monitoring events.

Extraction wells currently operating are sampled on a quarterly basis to evaluate system effectiveness and the volume of mass removed.

FIGURE 1

Extraction Area
Wells to be Sampled - Spring Event

ATI Millersburg Operations, Oregon

LEGEND

- Monitoring Well
- Extraction Well
- Well to be Sampled
- Railroad

N

0 100 200 300

Feet

Date: June 21, 2019
Data Sources: City of Albany GIS, ATI, DigitalGlobe 2017

GSI Water Solutions, Inc.

Document Path: Y:\0168_Wah_Chang\Source_Figures\028_2019\Sitewide_Exceedance_Analysis\Figure1_Extraction_Area_Spring.mxd

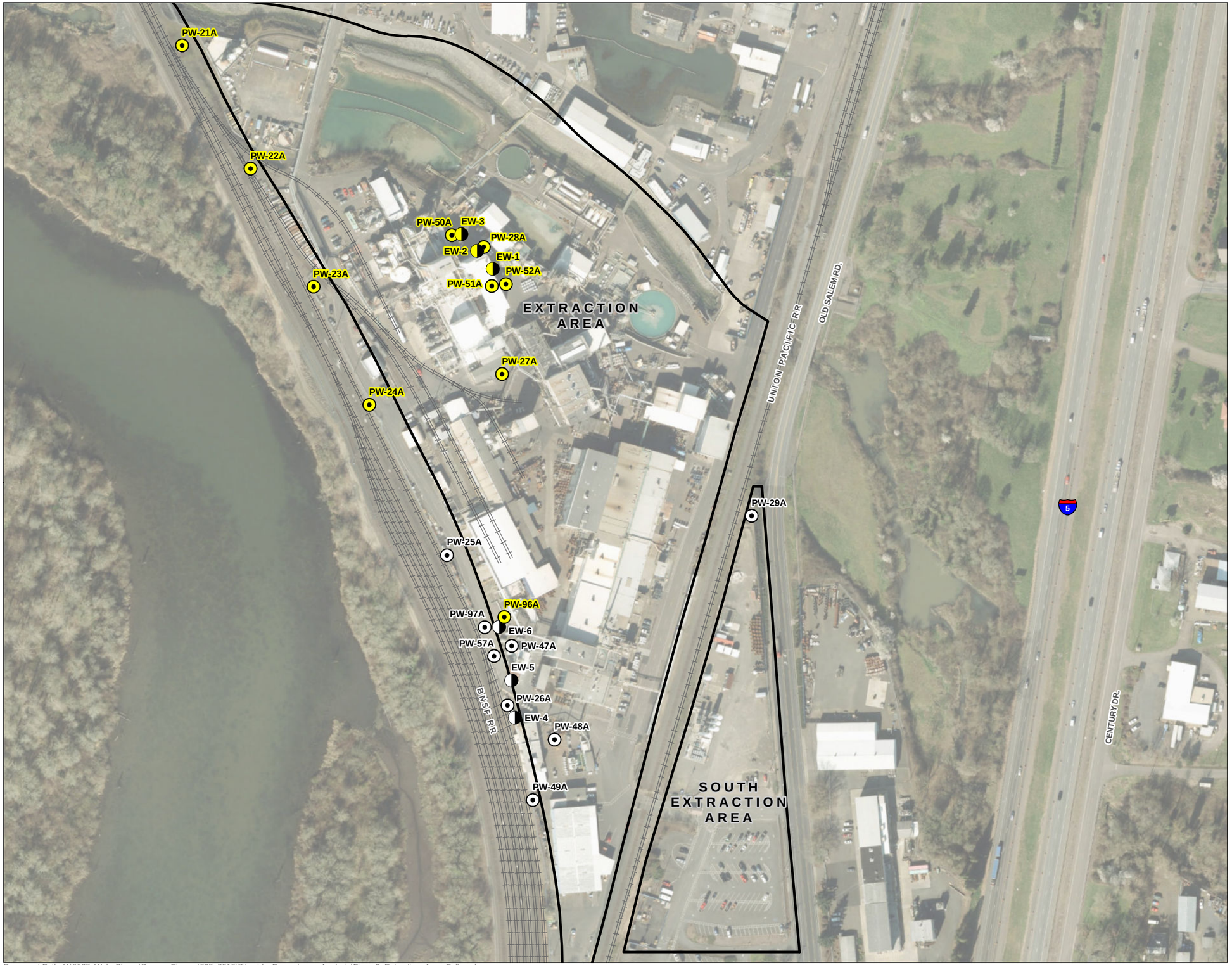


FIGURE 2

Extraction Area
Wells to be Sampled - Fall Event

ATI Millersburg Operations, Oregon

LEGEND

- Monitoring Well
- Extraction Well
- Well to be Sampled
- Railroad

N

0 100 200 300

Feet

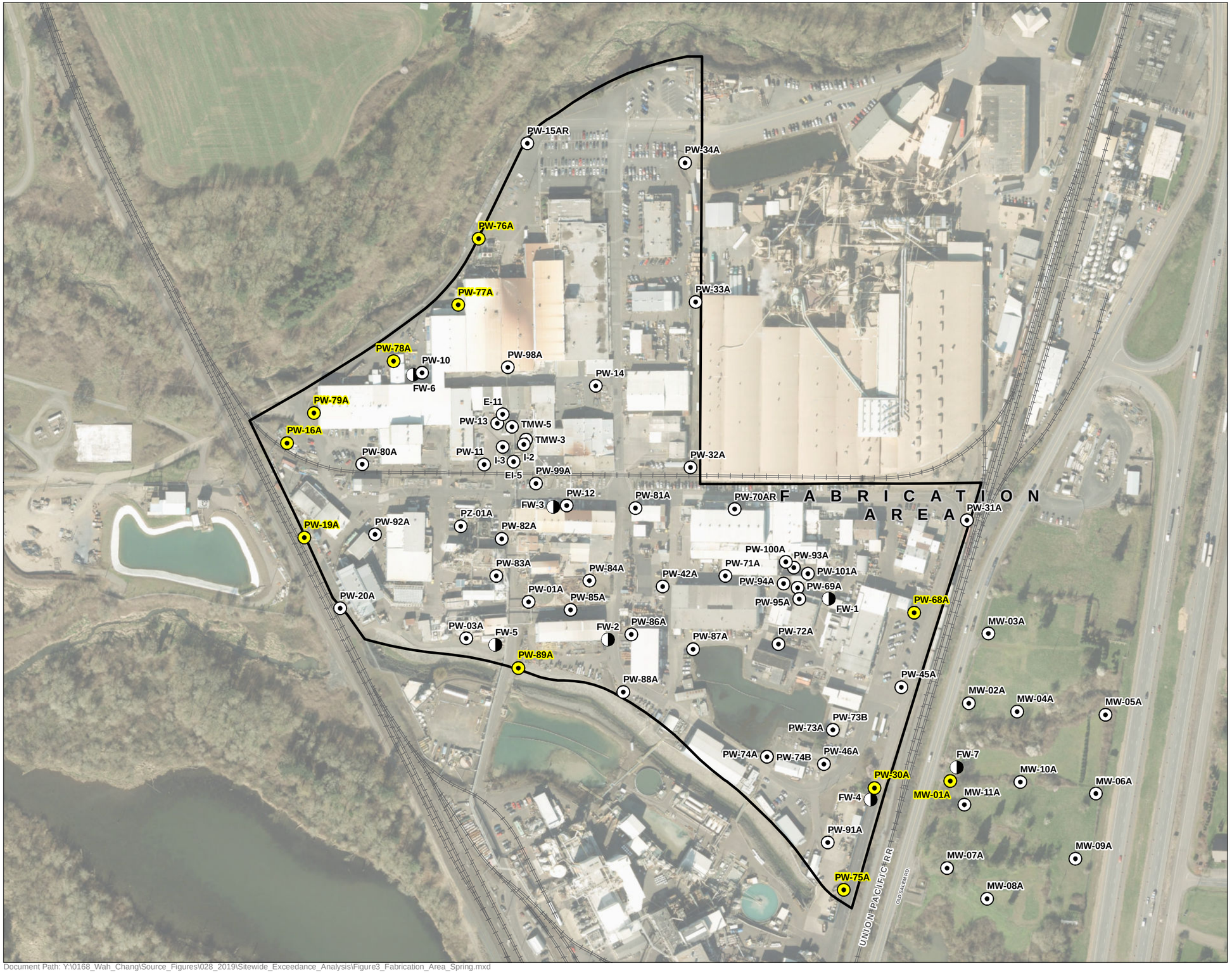
Date: June 21, 2019
Data Sources: City of Albany GIS, ATI, DigitalGlobe 2017

GSI Water Solutions, Inc.

Document Path: Y:\0168_Wah_Chang\Source_Figures\028_2019\Sitewide_Exceedance_Analysis\Figure2_Extraction_Area_Fall.mxd

FIGURE 3

Fabrication Area
Wells to be Sampled - Spring Event
ATI Millersburg Operations, Oregon



LEGEND

- Monitoring Well
- Extraction Well
- Well to be Sampled
- Railroad

N

0 125 250 375
Feet

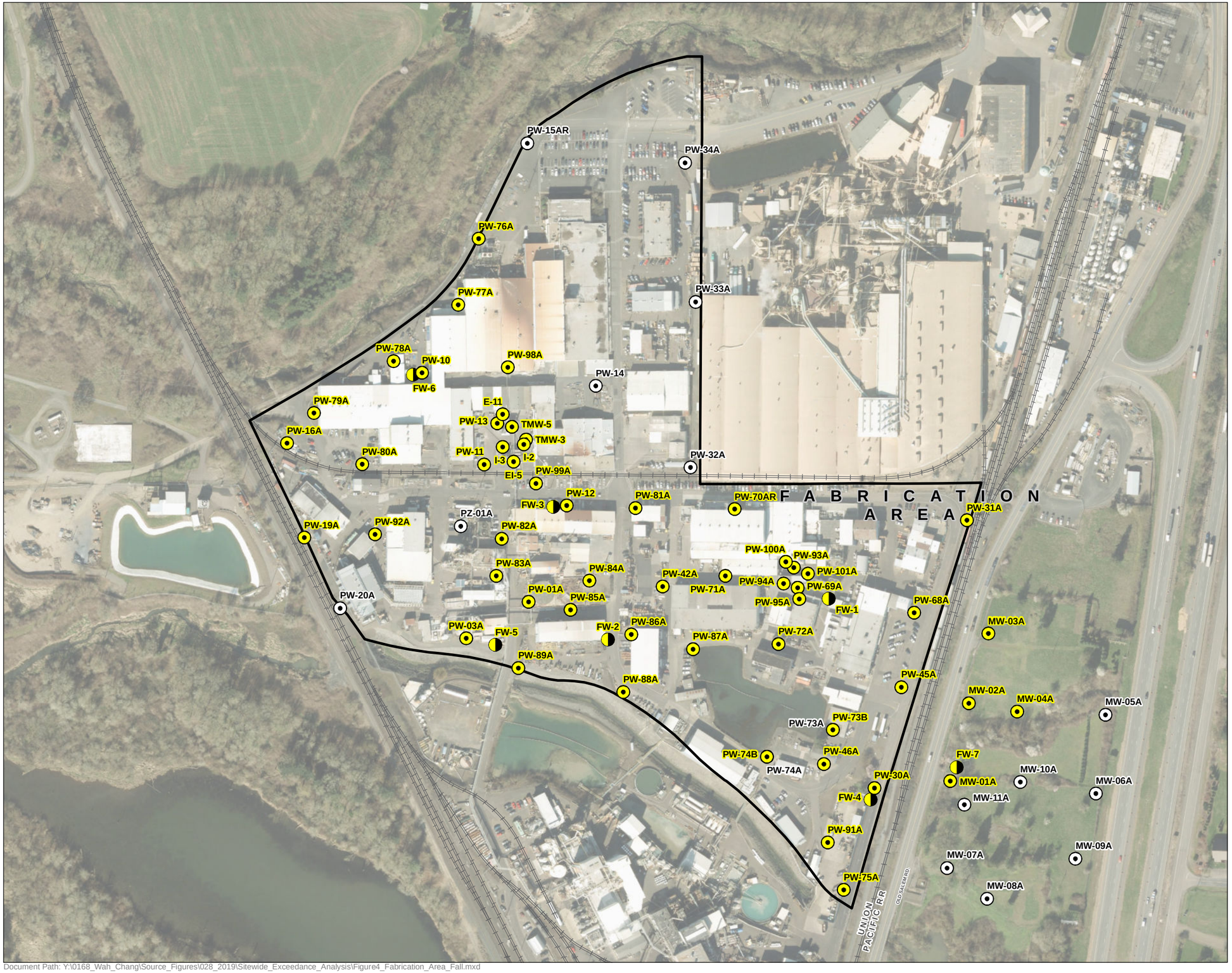
Date: June 21, 2019
Data Sources: City of Albany GIS, ATI, DigitalGlobe 2017

GSI Water Solutions, Inc.

Document Path: Y:\0168_Wah_Chang\Source_Figures\028_2019\Sitewide_Exceedance_Analysis\Figure3_Fabrication_Area_Spring.mxd

FIGURE 4

Fabrication Area
Wells to be Sampled - Fall Event
ATI Millersburg Operations, Oregon



LEGEND

- Monitoring Well
- Extraction Well
- Well to be Sampled
- Railroad

N

0 125 250 375
Feet

Date: June 21, 2019
Data Sources: City of Albany GIS, ATI, DigitalGlobe 2017

GSI Water Solutions, Inc.

Document Path: Y:\0168_Wah_Chang\Source_Figures\028_2019\Sitewide_Exceedance_Analysis\Figure4_Fabrication_Area_Fall.mxd

FIGURE 5

Solids Area
Wells to be Sampled – Annually
ATI Millersburg Operations, Oregon

LEGEND

- Monitoring Well
- Extraction Well
- Well to be Sampled
- Railroad

N

0 100 200 300
Feet

Date: June 21, 2019
Data Sources: City of Albany GIS, ATI, DigitalGlobe 2017

GSI Water Solutions, Inc.

Document Path: Y:\0168_Wah_Chang\Source_Figures\028_2019\Sitewide_Exceedance_Analysis\Figure5_Solids_Area_Fall.mxd

FIGURE 6

Farm Ponds Area
Wells to be Sampled – Annually

ATI Millersburg Operations, Oregon

LEGEND

- Monitoring Well
- Extraction Well
- Well to be Sampled
- Former Farm Ponds
- Railroad

N

0 100 200 300

Feet

Date: June 21, 2019
Data Sources: City of Albany GIS, ATI, DigitalGlobe 2017

GSI Water Solutions, Inc.

Document Path: Y:\0168_Wah_Chang\Source_Figures\028_2019\Sitewide_Exceedance_Analysis\Figure6_Farm_Ponds_Area_Spring.mxd